Remarks

Entry of the above amendments is respectfully requested. Claims 1-25 have been cancelled. Claims 26 and 34 have been amended. Claims 1-25 have been cancelled. Claims 36-42 have been added. Claims 26-44 are pending in the application. Favorable reconsideration and allowance of this application is respectfully requested in light of the forgoing amendments and the remarks that follow.

In the Action, the Examiner objected to the priority claim included in the as-filed declaration. Applicant notes the mistake and hereby submits a substitute declaration executed by the Inventors on November 30, 2004, removing the priority claim. Applicant appreciates the Examiners diligence in noting this error and would appreciate the Examiner's acknowledgement of Applicant's correction of this mistake.

Next, the Examiner rejected claims 26, 27 and 29-35 under 35 U.S.C. § 102(b) as being anticipated by *Horrocks et al.* In particular, the Examiner indicated that *Horrocks et al.* disclose a scanning electrochemical potential microscope and that *Horrocks et al.* is capable of supporting measurements of a potential gradient, citing figures 2 and 3 as evidence that a potential gradient is established between the sample and the tip. Moreover, the Examiner concludes that *Horrocks et al.* disclose a bi-potentiostat, and thus disclose (1) using a measured potential as a feedback parameter to control tip-sample separation, and (2) tuning the

measurement. Finally, the Examiner seems to contend that that forming an electrical double layer, and operating the AFM exclusively therein, is only a statement of intended use. Applicant respectfully disagrees with the Examiner's conclusions for the following reasons.

Initially, Applicant notes that *Horrocks et al.* disclose nothing more than a scanning electrochemical microscope (SECM), an instrument that is discussed and distinguished at length in the Specification of the present application, including the Background. In addition to the discussion in the Specification, Applicant notes the following regarding the differences between the present SEPM, and prior art SECM. First, although SECM does have a potentiometric mode, SECM uses a relatively large tip that operates in the diffusion layer, as opposed to the electrical double layer. The diffusion layer is microns high from the sample surface and thus when imaging at such large tip-sample separations, poor image resolution results, as understood by those skilled in the art. In contrast, the electrical double layer is typically only several nanometers (or less), such that when measuring the potential gradient at such close range, much higher resolution can be achieved.

Clearly, measuring a potential gradient at the electrical double layer is not merely a statement of intended use, it is required by the present invention such that measuring a gradient at some other location (for example, the diffusion layer) is of no use. In the end, because

SECM, as described in *Horrocks et al.* or otherwise, is not directed to operating in the electrical double layer, and it cannot anticipate the present invention.

To clarify this aspect of the invention, Applicant has amended claim 26 to define that the potential gradient being measured is the gradient generated by the electrical double layer, with the tip disposed at the electrical double layer. It is important to note that *Horrocks et al.* not only does not disclose operating a probe to measure a potential gradient at the electrical double layer, the *Horrocks et al.* system is not capable of operation with the tip at the electrical double layer given that the tip radius they disclosed and used was 2.5 microns. As understood in the art, using such a tip would restrict *Horrocks et al.* from bringing the tip into the double layer without damaging the tip or the sample.

In addition to not operating in the electrical double layer, in SECM, an ion-selective potentiometric probe is required. As stated in *Horrocks et al.* itself, an ammonium-selective microelectrode is required so as to sense the potential gradient generated by a concentration gradient of a specific species of liquid, in this case ammonium. (See *Horrocks et al.*, page 1116) SEPM, in contrast, does not require an ion-selective potentiometric probe; rather, SEPM can use any conventional AFM probe given that the potential gradient that is being measured can be generated by any charge or molecular dipole. For example, nanopure water can be used. This is yet another distinction between the prior art SECM and the present invention SEPM.

Overall, in view of the above remarks and the present amendment to claim 26, independent claim 26 is novel and non-obvious over *Horrocks et al.*, and an indication to that effect is respectfully requested.

Moreover, each of dependant claims 27-35, as well as new dependant claims 36 and 37, are likewise allowable. Referring to claims 36 and 37, these claims have been added to make clear that claim 26 is not limited to using a solution of a particular species or ion-selective probe, thus further distinguishing the present invention from SECM. Also, with specific reference to claims 29 and 30, applicant steadfastly disagrees that a disclosure of a bi-potentiostat is a disclosure of using a measurement of potential in a feedback loop to control tip-sample separation, as defined in these claims. *Horrocks et al.* contains no discussion or suggestion regarding "feeding back" potential to control tip-sample separation. In fact, before the present preferred embodiments, at least some of those skilled in the art concluded that potentiometric tips could not rely on positive and negative feedback diffusion, concluding that it was difficult to assess the tip-sample distance from the tip response. Claims 29 and 30, as a result, are allowable for at least this additional reason.

Continuing with the distinction regarding feeding back potential, the applicant has added new independent claim 38 to specifically define that the measured potential is being used in a feedback loop to control tip-sample separation. As a result, the SEPM as defined in claim 38

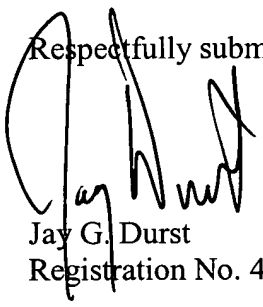
clarifies that topography can be mapped by monitoring the potential at the sample surface. Again, *Horrocks et al.* do not disclose nor even suggest performing any such function. As a result, new claim 38 as well as claims 39-44 dependant therefrom, are similarly allowable. An indication to that effect is respectfully requested.

Conclusion

In view of the present amendments and the above Remarks, it is submitted that claims 26-35, as well as new claims 36-44 are in compliance with 35 U.S.C. §§ 102, 103 and 112, and thus each define patentable subject matter. A Notice of Allowance is therefore respectfully requested. The Examiner is please asked to contact the undersigned by telephone if it would help expedite the prosecution and allowance of this application.

Given the cancellation of claims 1-25, no fee is believed to be payable in connection with the added claims. Nevertheless, should the Examiner consider any fee to be payable in conjunction with this or any future communication, the Director is authorized to direct payment of such fees, or credit any overpayments to Deposit Account No. 50-1170.

Respectfully submitted,



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